and 4. These solutions were not received in time to be acknowledged in March No.—ED.]

PROBLEMS.

9. **Proposed by ISAAC I. BEVERAGE, Monterey, Virginia.**

It is required to find three numbers the sum of whose 4th power is a square.

10. **Proposed by L. B. HAYWARD, Bingham, Ohio.**

Find two numbers such that each of them and also their sum and their difference when increased by unity shall all be square numbers.

AVERAGE AND PROBABILITY.

Conducted by B. F. FINKEL, Kidder, Mo. All contributions to this department should be sent to him.

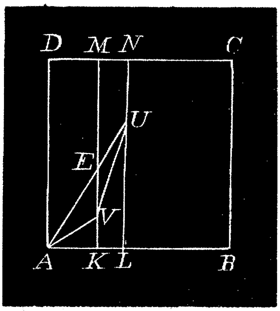
SOLUTIONS TO PROBLEMS.

2. **Proposed by O. S. KIBLER, Superintendent of Schools, West Middleburg, Logan Co., Ohio.**

Find the average area of a triangle formed by joining an angle of a square with any two points within the square.

Solution by Professor G. B. M. ZERR, Principal of High School, Staunton, Virginia.

Let $ABCD$ be the square side a, and U, V, the two random points.



Through V, U draw KM, NL, parallel to AD, KM meeting AU in E.

Let $AL=X$, $AK=w$, $LU=y$, $KV=z$, $KE=z'$.

Then $z'=\frac{wy}{x}$; also

area $AUV=\frac{1}{2}(wy-xz)=u$, when $z<z'$,

area $AUV=\frac{1}{2}(xz-wy)=u_1$, when $z>z'$.

The limits of x are 0 and a; of w, 0 and x; of y, 0 and a; of z, 0 and z', and z' and a.

Hence, the required average area is

$$\Delta=\frac{\int_0^a\int_0^x\int_0^a\left\{\int_0^{z'}udz+\int_{z'}^a u_1dz\right\}dxdwdy}{\int_0^a\int_0^x\int_0^a\int_0^a dxdwdydz}.$$

$$=\frac{2}{a^4}\int_0^a\int_0^x\int_0^a\left\{\int_0^{z'}udz+\int_{z'}^a u_1dz\right\}dxdwdy.$$

$$=\frac{1}{2a^4}\int_0^a\int_0^x\int_0^a\left(\frac{2w^2y^2}{x}+a^2x-2awy\right)dxdwdy,$$